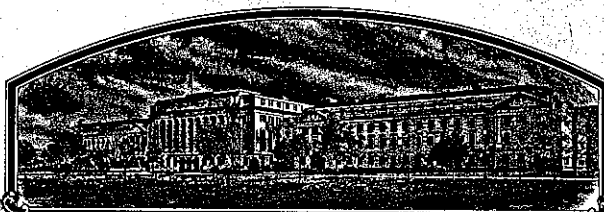


No.

8300004



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Western Plant Breeders, Inc.

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF *eighteen* YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. IN THE UNITED STATES SEED OF THIS VARIETY (1) SHALL BE SOLD BY VARIETY NAME ONLY AS CERTIFIED SEED AND (2) SHALL CONFORM TO THE NUMBER OF GENERATIONS OF SEED BY THE OWNER OF THE RIGHTS. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

BARLEY

'WestBred 501'

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington this 26th day of April in the year of our Lord one thousand nine hundred and eighty-five.

Attest:

Kenneth Evans
Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

John R. Block
Secretary of Agriculture

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
LIVESTOCK, POULTRY, GRAIN & SEED DIVISION

FORM APPROVED
OMB NO. 40-R3822

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

INSTRUCTIONS: See Reverse.

No certificate for plant variety protection may be issued unless a completed application form has been received (5 U.S.C. 553).

1a. TEMPORARY DESIGNATION OF VARIETY BFP-78-20		1b. VARIETY NAME WESTBRED 501		FOR OFFICIAL USE ONLY PV NUMBER 8300004	
2. KIND NAME Barley		3. GENUS AND SPECIES NAME Hordeum vulgare		FILING DATE 10/22/82	TIME 2:30 P.M.
4. FAMILY NAME (BOTANICAL) Gramineae		5. DATE OF DETERMINATION 4-15-81		FEE RECEIVED \$ 500.00 \$ 250.00	DATE 10/22/82 4/1/85
6. NAME OF APPLICANT(S) WPB ACQUISITION INC. Western Plant Breeders (a Maryland Corporation)		7. ADDRESS (Street and No. or R.F.D. No., City, State, and ZIP Code) P.O. Box 1110, 1918 W. Van Buren Phoenix, Arizona 85001		8. TELEPHONE AREA CODE AND NUMBER (602) 257-1223	
9. IF THE NAMED APPLICANT IS NOT A PERSON, FORM OF ORGANIZATION: (Corporation, partnership, association, etc.) Corporation		10. IF INCORPORATED, GIVE STATE AND DATE OF INCORPORATION Arizona Dec. 1, 1977		11. DATE OF INCORPORATION Dec. 1, 1977	
12. NAME AND MAILING ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS: Dale R. Clark Western Plant Breeders P.O. Box 1409 RT. #3 Box 366 BOZEMAN Conrad, Montana 59425					
13. CHECK BOX BELOW FOR EACH ATTACHMENT SUBMITTED: <input checked="" type="checkbox"/> 13A. Exhibit A, Origin and Breeding History of the Variety (See Section 52 of the Plant Variety Protection Act.) <input checked="" type="checkbox"/> 13B. Exhibit B, Novelty Statement. <input checked="" type="checkbox"/> 13C. Exhibit C, Objective Description of the Variety (Request form from Plant Variety Protection Office.) <input type="checkbox"/> 13D. Exhibit D, Additional Description of the Variety.					
14a. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? (See Section 83(a). (If "Yes," answer 14B and 14C below.) <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO					
14b. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		14c. IF "YES," TO 14B, HOW MANY GENERATIONS OF PRODUCTION BEYOND BREEDER SEED? <input type="checkbox"/> FOUNDATION <input type="checkbox"/> REGISTERED <input type="checkbox"/> CERTIFIED			
15a. DID THE APPLICANT(S) FILE FOR PROTECTION OF THIS VARIETY IN OTHER COUNTRIES? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO (If "Yes," give name of countries and dates.)					
15b. HAVE RIGHTS BEEN GRANTED THIS VARIETY IN OTHER COUNTRIES? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO (If "Yes," give name of countries and dates.)					
16. DOES THE APPLICANT(S) AGREE TO THE PUBLICATION OF HIS/HER (THEIR) NAME(S) AND ADDRESS IN THE OFFICIAL JOURNAL? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO					
17. The applicant(s) declare(s) that a viable sample of basic seed of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable. The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in Section 41, and is entitled to protection under the provisions of Section 42 of the Plant Variety Act. Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.					

October 19, 1982
(DATE)

Dale R. Clark
(SIGNATURE OF APPLICANT)

- 13A. WestBred 501 was selected by Western Plant Breeders from the F₂ bulk of CCXXXII-76 X Arivat in the spring of 1977, as a single plant. An F₃ row was grown at Conrad, Montana in the summer of 1977 and a plant selection from this row was grown as an F₄ plot at Chandler, Arizona in 1978. Twenty heads were selected from the F₄ plot and F₅ head rows were grown at Conrad, Montana in the summer of 1978. Uniform head rows were harvested and bulked. The resulting F₆ bulk and the successive F₇ and F₈ bulks were yield tested throughout the irrigated areas of Arizona, California, Idaho, Montana, and Utah in 1979, 1980, and 1981. Plants were selected from the F₇ bulk in 1980 and grown as plant plots at Conrad, Montana in the summer of 1980. Seed from each plot was planted in long strips at Chandler, Arizona in the fall of 1980. Uniform strips were harvested and bulked in the spring of 1981. This seed was used to plant ten (10) acres at Conrad, Montana in 1981 for the production of Breeders Seed and designated WestBred 501.

WestBred 501 is a stable and uniform variety in agronomic appearance and performance across several generations and growing conditions. Agronomic data to support stability is presented in the tables.

- 13B. WestBred 501 is a semi-dwarf, six rowed, spring barley, medium in maturity with short, strong straw. It is most similar in phenotypic appearance to the variety Gus. The aleurone color of Gus is blue and that of WestBred 501 is white. The plant height of WestBred 501 is 5-8 cm. shorter than Gus and WestBred 501 heads three to four days earlier than Gus. WestBred 501's plant color is heading is darker green than Gus, partly due to the leaves having a thicker coating of wax. Seed protein of WestBred 501 is 1/2% to 1% higher than Gus.

Table Ia.

Yield in lbs. per acre of WestBred 501 and presently grown varieties in Western Plant Breeders trials in the Southwestern United States.

<u>Location</u>	<u>Year</u>	<u>WestBred 501</u>	<u>Gus</u>	<u>Arivat</u>	<u>Prato</u>	<u>CM-72</u>	<u>Sunbar 409</u>
Phoenix, Az.	1979	6834	6097	5025	----	4288	----
	1980	6635	5087	4208	6175	4647	6406
	1981	5828	5922	5170	6063	4406	6063
Roll, Az.	1980	5275	5024	4772	4960	3894	5776
El Centro, Ca.	1980	5149	4208	----	5149	5840	4961
	1981	5250	5100	5050	4800	3900	4300
Fresno, Ca.	1981	4235	4180	----	3850	----	----
Davis, Ca.	1980	5530	5672	----	5388	3120	----
	1981	4510	3410	----	3575	----	----

Table Ib.

Yield in lbs. per acre of WestBred 501 and presently grown varieties in Western Plant Breeders Trials in the Northwestern United States.

<u>Location</u>	<u>Year</u>	<u>WestBred 501</u>	<u>Gus</u>	<u>Steptoe</u>	<u>Kombar</u>
Nampa, Id.	1980	5400	5275	5903	----
	1981	6200	5850	5900	6000
Burley, Id.	1981	7600	6756	5798	----
Tremonton, Ut.	1980	4900	4300	4620	----
	1981	5350	4550	3750	6000
Conrad, Mt.	1980	5487	5104	5487	----
	1981	5278	5152	6496	----

Table Ic. Yield in lbs. per acre of WestBred 501 and presently grown varieties in public trials.

<u>Location</u>	<u>Year</u>	<u>WestBred 501</u>	<u>Gus</u>	<u>Sunbar 400</u>	<u>Prato</u>	<u>CM-72</u>
<u>University of California</u>						
Sutter County	1980	5175	5204	4923	6110	5230
	1981	4930	4370	4580	3970	3920
San Luis Obispo, Ca.	1981	4430	4030	3880	4490	4350
Yolo, Co.	1981	3640	2930	3370	3000	2320
Merced, Co.	1981	3390	2860	2730	3230	2910
<u>Oregon State University</u>						
Malheur, Or.	1981	6492	4691	<u>Kombar 6549</u>	<u>Steptoe 5448</u>	

Table II.

Plant height (inches) of WestBred 501 and presently grown varieties in Western Plant Breeders and public trials.

<u>Location</u>	<u>Year</u>	<u>WestBred 501</u>	<u>Gus</u>	<u>Arivat</u>	<u>Prato</u>	<u>Steptoe</u>	<u>Kombar</u>
Phoenix, Az.	1979	30	36	44	--	--	41
	1980	36	39	46	39	--	--
	1981	31	37	45	37	--	--
Fresno, Ca.	1981	32	35	--	33	--	--
Davis, Ca.	1980	33	35	--	42	--	--
Nampa, Id.	1980	29	32	--	--	38	--
	1981	33	38	--	--	49	37

Table III.

Heading dates of WestBred 501 and presently grown varieties in Western Plant Breeders and public trials.

<u>Location</u>	<u>Year</u>	<u>WestBred 501</u>	<u>Gus</u>	<u>Arivat</u>	<u>Prato</u>	<u>CM-72</u>	<u>Steptoe</u>
Phoenix	1980	3/20	3/24	3/13	3/17	3/1	--
	1981	3/19	3/23	3/15	3/19	3/13	--
Malheur, Or.	1981	5/31	6/2	--	--	--	6/3

Table IV.

Lodging (percentage) of WestBred 501 and presently grown varieties in Western Plant Breeders and public trials.

<u>Location</u>	<u>Year</u>	<u>WestBred 501</u>	<u>Gus</u>	<u>Arivat</u>	<u>Prato</u>	<u>CM-72</u>	<u>Steptoe</u>
Phoenix, Az.	1980	0	10	75	75	100	--
	1981	0	0	15	10	25	--
Davis, Ca.	1981	0	0	--	100	100	--
Fresno, Ca.	1981	0	10	--	50	80	--
Nampa, Id.	1980	0	10	--	--	--	15
	1981	0	15	--	--	--	100
Tremonton, Ut.	1981	0	0	--	--	--	100

Table V.

Protein (percentage) of WestBred 501 and
presently grown varieties in Western Plant
Breeders trials.

<u>Location</u>	<u>Year</u>	<u>WestBred 501</u>	<u>Gus</u>	<u>Arivat</u>	<u>Prato</u>	<u>Steptoe</u>
Phoenix, Az.	1981	12.6	10.9	11.3	11.6	--
El Centro, Ca.	1981	14.4	13.4	13.6	--	--
Davis, Ca.	1981	9.0	8.4	----	9.6	----
Nampa, Id.	1981	13.8	13.3	----	----	12.3
Tremonton, Ut.	1981	13.0	12.2	----	----	11.0
Burley, Id.	1981	12.7	12.4	----	----	11.9

OBJECTIVE DESCRIPTION OF VARIETY
BARLEY (*HORDEUM VULGARE*)

INSTRUCTIONS: See Reverse.

NAME OF APPLICANT(S)

Western Plant Breeders, Inc.

ADDRESS (Street and No. or R.F.D. No., City, State, and ZIP Code)

P.O. Box 1110
Phoenix, Arizona 85001

FOR OFFICIAL USE ONLY

PVPO NUMBER

8300004

VARIETY NAME OR TEMPORARY
DESIGNATION

WestBred 501

Place the appropriate number that describes the varietal character of this variety in the boxes below.
Place a zero in first box (i.e. or) when number is either 99 or less or 9 or less.

1. GROWTH HABIT:

 1 = SPRING 2 = FACULTATIVE WINTER 3 = WINTER Early Growth: 1 = PROSTRATE 2 = SEMIPROSTRATE
3 = ERECT

2. MATURITY (50% Flowering):

 1 = EARLY (California Mariout) 2 = MIDSEASON (Betzes) 3 = LATE (Frontier)

<input type="text"/>	No. of days Earlier than	<input type="text"/>	{	1 = BETZES	2 = CALIFORNIA MARIOUT	3 = CONQUEST	4 = DICKSON
<input type="text"/>	No. of days Later than	<input type="text"/>		5 = PIROLINE	6 = PRIMUS	7 = UNITAN	

3. PLANT HEIGHT (From soil level to top of head):

 1 = SEMIDWARF 2 = SHORT (California Mariout) 3 = MEDIUM TALL (Betzes) 4 = TALL (Conquest)

<input type="text"/>	Cm. Shorter than	<input type="text"/>	{	1 = BETZES	2 = CALIFORNIA MARIOUT	3 = CONQUEST	4 = DICKSON
<input type="text"/>	Cm. Taller than	<input type="text"/>		5 = PIROLINE	6 = PRIMUS	7 = UNITAN	

4. STEM:

 Exertion (Flag to spike at maturity): 1 = 0 - 3 cm. 2 = 3 - 10 cm. 3 = 10 - 15 cm. Anthocyanin: 1 = ABSENT 2 = PRESENT NO. OF NODES (Originating from node above ground) Collar Shape: 1 = CLOSED 2 = V-SHAPED 3 = OPEN 4 = MODIFIED CLOSED OR OPEN Shape of Neck: 1 = STRAIGHT 2 = SNAKY
3 = OTHER (Specify)

5. LEAF:

 Basal leaf sheath (seedling): 1 = GLABROUS 2 = PUBESCENT Position of flag leaf (at boot stage): 1 = DROOPING
2 = UPRIGHT Waxiness: 1 = ABSENT (Glossy) 2 = SLIGHTLY WAXY
3 = WAXY MM. WIDTH (First leaf below flag leaf) CM. LENGTH (First leaf below flag leaf) Anthocyanin in leaf sheath: 1 = ABSENT 2 = PRESENT

6. HEAD:

 Type: 1 = TWO-ROWED 2 = SIX-ROWED Density: 1 = LAX 2 = ERECT (Not dense)
3 = ERECT (Dense) Shape: 1 = TAPERING 2 = STRAP 3 = CLAVATE
4 = OTHER (Specify) Waxiness: 1 = ABSENT (Glossy) 2 = SLIGHTLY WAXY
3 = WAXY Lateral Kernels Overlap: 1 = NONE 2 = AT TIP
3 = 1/4 - 1/2 OF HEAD Rachis (Hair on edge): 1 = LACKING 2 = FEW 3 = COVERED

7. GLUME:

 Length: 1 = 1/3 OF LEMMA 2 = 1/2 OF LEMMA
3 = MORE THAN 1/2 OF LEMMA Hairs: 1 = NONE 2 = SHORT 3 = LONG Hair covering: 1 = NONE 2 = RESTRICTED TO MIDDLE 3 = CONFINED TO BAND 4 = COMPLETELY COVERED Awns: 1 = LESS THAN EQUAL TO LENGTH OF GLUMES 2 = EQUAL TO LENGTH OF GLUMES
3 = MORE THAN EQUAL TO LENGTH OF GLUMES Awn Surface: 1 = SMOOTH 2 = SEMISMOOTH 3 = ROUGH

8. LEMMA:

- ☐ 5 Awn: 1 = AWNLESS 2 = AWNLETS ON CENTRAL ROWS AWNLESS ON LATERAL ROWS
 3 = SHORT ON CENTRAL ROWS, AWNLETS ON LATERAL ROWS 4 = SHORT (less than equal to length of spike)
 5 = LONG (longer than spike) 6 = HOODED
- ☐ 2 Awn Surface: 0 = AWNLESS 1 = SMOOTH 2 = SEMISMOOTH 3 = ROUGH
- ☐ 1 Teeth: 1 = ABSENT 2 = FEW 3 = NUMEROUS ☐ 1 Hair: 1 = ABSENT 2 = PRESENT
- ☐ 1 Shape of base: 1 = DEPRESSION 2 = SLIGHT CREASE 3 = TRANSVERSE CREASE ☐ 2 Rachilla Hairs: 1 = SHORT 2 = LONG

9. STIGMA:

- ☐ 2 Hairs: 1 = FEW 2 = MANY

10. SEED:

- ☐ 2 Type: 1 = NAKED 2 = COVERED ☐ 1 Hairs on Ventral Furrow: 1 = ABSENT 2 = PRESENT
- ☐ 3 Length: 1 = SHORT (8.0 mm.) 2 = SHORT TO MIDLONG (7.5 - 9.0 mm.) 3 = MIDLONG (8.5 - 9.5 mm.)
 4 = MIDLONG TO LONG (9.0 - 10.5 mm.) 5 = LONG (10.0 mm.)
- ☐ 3 Wrinkling of hull: 1 = NAKED 2 = SLIGHTLY WRINKLED 3 = SEMIWRINKLED 4 = WRINKLED
- ☐ 1 Aleurone Color: 1 = COLORLESS (White or Yellow) 2 = BLUE
- ☐ 0 ☐ 2 PERCENT ABORTIVE ☐ 4 ☐ 4 GMS. PER 1000 SEEDS

11. DISEASE: (0 = Not Tested, 1 = Susceptible, 2 = Resistant)

- ☐ 0 SEPTORIA ☐ 2 NET BLOTCH ☐ 0 SPOT BLOTCH ☐ 2 POWDERY MILDEW
- ☐ 1 LOOSE SMUT ☐ 1 BACTERIAL BLIGHT ☐ 1 COVERED SMUT ☐ 1 FALSE LOOSE SMUT
- ☐ 0 STEM RUST ☐ 1 LEAF RUST ☐ 0 SCAB ☐ 2 SCALD
- ☐ 0 AY ☐ 0 BSMV ☐ 2 BYDV ☐ 0 OTHER (Specify)

12. INSECT: (0 = Not tested, 1 = Susceptible 2 = Resistant)

- ☐ 0 GREEN BUG ☐ 0 ENGLISH GRAIN APHID ☐ 0 CHINCH BUG ☐ 0 ARMYWORM
- ☐ 0 GRASS HOPPERS ☐ 0 CERIAL LEAF BETTLE ☐ 0 OTHER (Specify)
- HESSIAN FLY RACES } ☐ 0 GP ☐ 0 A ☐ 0 B ☐ 0 C
☐ 0 D ☐ 0 E ☐ 0 F ☐ 0 G

13. CHEMICAL (0 = Not Tested, 1 = Susceptible, 2 = Resistant)

- ☐ DDT ☐ OTHER (Specify)

14. INDICATE WHICH VARIETY MOST CLOSELY RESEMBLES THAT SUBMITTED:

CHARACTER	NAME OF VARIETY	CHARACTER	NAME OF VARIETY
Plant tillering	Gus	Seed size	Gus
Leaf size	Gus	Coleoptile elongation	Gus
Leaf color	Gus	Seedling pigmentation	Gus
Leaf carriage	Gus		

REFERENCES: The following publications may be used as a reference aid for the standardization of character descriptions and terms used in this form:

1. Wiebe, G. A., and D. A. Reid, 1961, Classification of Barley Varieties Grown in the United States and Canada in 1958, Technical Bulletin No. 1224, U.S. Dept. of Agriculture.
2. Reid, D. A., and G. A. Wiebe, 1968, Barley: Origin, Botany, Culture, Winter Hardiness, Genetics, Utilization, Pests, Agriculture Handbook No. 338, U.S. Dept. of Agriculture. pp. 61 - 84.
3. Malting Barley Improvement Association, Milwaukee, Wisconsin, 1971, Barley Variety Dictionary.

COLOR: Nickerson's or any recognized color fan may be used to determine color of the described variety.

STATE OF ARIZONA }
County of Maricopa) ss.

ASSIGNMENT

WHEREAS, WESTERN PLANT BREEDERS, INC., an Arizona corporation (a/k/a) WESTERN PLANT BREEDERS), having its principal place of business at Phoenix, Arizona, has adopted, used and is using the following Certificate of Protection which is registered in the Plant Variety Protection Office of the Secretary of Agriculture:

Certificate No. 8300004

WestBred 501

Barley

WHEREAS, WPB ACQUISITION INC., a Maryland corporation, having its principal place of business in Hayward, California, is desirous of acquiring said Plant Variety Protection Certificate; and

WHEREAS, WESTERN PLANT BREEDERS, INC., states that it has title to the above Certificate and that this transfer does not violate any applicable ruling or order of any court or agency of competent jurisdiction.

NOW, THEREFORE, for valuable consideration, receipt of which is hereby acknowledged, WESTERN PLANT BREEDERS, INC. does hereby assign and set over to WPB ACQUISITION INC., all of the right, title and interest of WESTERN PLANT BREEDERS, INC., in and to the variety of barley named:

"WestBred 501"

together with all goodwill associated with that variety and that name, and together with all rights under and to that Certificate of Plant Variety Protection, No. 8300004, issued by the Secretary of Agriculture of the United States of America on April 26, 1985.

WESTERN PLANT BREEDERS, INC.

By Albert E. Carleton
Albert E. Carleton, President

On this 30th day of September, 1985, before me, appeared Albert E. Carleton, to me personally known, who, being by me duly sworn, did say that he is the president of WESTERN PLANT BREEDERS, INC., an Arizona corporation, and that the foregoing Assignment is on behalf of said corporation.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my notarial seal at my office in Phoenix, Arizona the day and year last above written.

James M. Bolton aka James M. Smith
Notary Public

My Commission Expires:

November 3, 1986